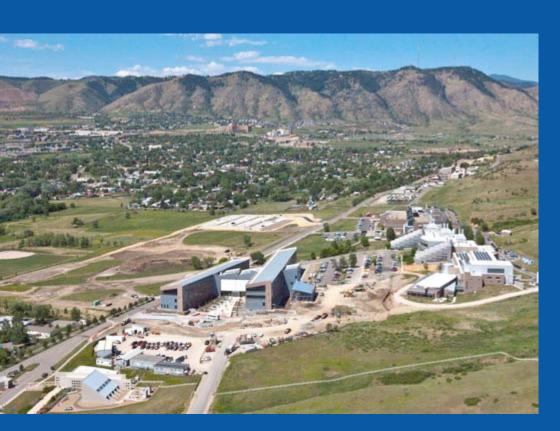




Ensuring Quality of PV Modules



26th PVSEC

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Outline

- Motivation Customers want to be able to assure quality of PV modules
- Two parts of quality assurance (QA)
 - During design phase
 - During manufacturing phase

Motivation: the question on the street "How do I predict lifetime of PV modules?"

- Reliability engineer: How do I test to determine the number of years for the warranty?
- PV customer: How do I choose the PV module that will last longer?
- PV investor: How do I know that I'm making a safe investment of \$1 billion (if the modules fail after 10 yr, the warranty will be worthless because the company will be gone)?
- Insurance company: How do I determine rates for insuring PV installations?

Two parts of Quality Assurance

1. Is the *design* durable for the intended application?

- Depends on location (hot & humid; hot & dry, temperate, etc.)
- Depends on mounting (close-roof mount runs hotter; partially shaded modules undergo different types of stress)
- Depends on application (a customer may plan to resurface the roof 10 years from now and only cares about the modules lasting that long)

2. Are the modules consistently manufactured?

 Could variations in the material composition or manufacturing processes result in premature failure of some fraction of the modules?

Current Status

1. Is the design durable for the intended application?

- IEC qualification tests (61215, 61646, 62108) give pass-fail indication, but do not address the variability of the stresses
- The relationship between passing the test and the expected service life is not well documented (maybe 10 years in some locations; less in others?)
- Each test lab is suggesting a testing protocol

2. Are the modules consistently manufactured?

 The certification to IEC 61215 may or may not indicate that there is an ongoing QA program

No way to look at a module and quickly assess its quality/durability

PV QA Task Force

The PV QA Task Force has been formed to address these needs

Today's meeting will describe this opportunity in more detail

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